

**ORDER**

**DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION**

6850.13A

10/24/81

MEDIUM INTENSITY APPROACH LIGHT SYSTEM,  
SUBJ: 40 FEET to 128 FEET MOUNTING HEIGHT

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1. PURPOSE. This order directs the use of Specification FAA-C-2626 with Amendment 1, and the standard drawings series D-6086 and 6065 listed in appendix 1 and 2: (a) to establish medium-intensity approach light system with or without runway alignment indicator lights (MALSR or MALS) for light mounting heights 40 feet-0 inches to 128 feet-0 inches; and (b) to retrofit existing MALS or MALSR systems with light mounting heights 40 feet-0 inches to 128 feet-0 inches using the 20-foot, low-impact resistance assembly and the electrical equipment designated in the latest additions of Orders 6850.8, Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR), and 6850.11, Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR).

2. DISTRIBUTION. This order is distributed to branch level in the Airway Facilities Service and Office of Airport Standards and to division level in the Office of Flight Operations and Air Traffic, Logistics, and Systems Research and Development Services in Washington headquarters; branch level in the regional Airway Facilities, Airports, Air Traffic, and Flight Standards divisions (except AEU); and to director level at the FAA Technical Center and the Aeronautical Center.

3. CANCELLATION. Order 6850.13, Medium-Intensity Approach Lighting System, 40' to 128' Mounting Height, dated 6/28/78, is canceled.

4. BACKGROUND.

a. Drawings D-6086-0 thru D-6086-28 are issued to provide the proper installation of low impact resistance structures for MALS or MALSR system with light mounting height 40 feet-0 inches to 128 feet-0 inches. The top 20 feet of the structure is a low-impact resistance assembly, furnished to each site by the Washington headquarters; the remaining part of the structure is a steel tower, which will be procured by the region. The entire installation is to be accomplished using Specification FAA-C-2626, with Amendment 1, Construction of a Medium Intensity Approach Light System with Runway Alignment Indicator Lights. The MALS or MALSR electrical equipment to be used is designated in Orders 6850.8A, Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR), and 6850.11, Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR).

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Distribution: A-W(AF/AS)-3; A-W(FO/AT/LG/RD)-2;  
A-X(AF/AS/AT/FS)-3 (except AEU); A-YZ-1

Initiated By: AAF-510

b. Drawings D-6085-0 thru D-6065-10 are issued to provide proper retrofit of existing MALS or MALSR systems with light mounting height 40 feet-0 inches to 128 feet-0 inches. These drawings, supplemented with drawings D-6086-3 thru D-6086-8 and D-6086-28 and Specification FAA-C-2626, with Amendment 1, Construction of a Medium Intensity Approach Light System with Runway Alignment Indicator Lights, reflect the requirement for removing an appropriate 20-foot section of the existing steel structure and installing the 20-foot, low-impact resistance assembly which is furnished to each site by the Washington headquarters. The MALS or MALSR electrical equipment to be used in the retrofit projects is designated in Orders 6850.8, Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR), and 6850.11, Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR).

c. This order implements the stated policy in paragraph 5a of the latest edition of Order 6850.9, Revised Approach Lighting Criteria, for providing frangible structures at the top of steel towers, and establishes the developmental improvements for MALS or MALSR systems in excess of 40 feet. The MALS or MALSR systems with light mounting height 0 feet to 40 feet shall be in accordance with Orders 6850.8, Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR), and 6850.11, Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR).

## 5. APPLICATION.

a. Establishment. Drawing D-6086-0 thru D-6086-28 and Specification FAA-C-2626 with Amendment 1, Construction of a Medium Intensity Approach Light System with Runway Alignment Indicator Lights, establish construction standards for MALS or MALSR low-impact resistance structures with light mounting height 40 feet-0 inches to 128 feet-0 inches. The standard drawings shall be supplemented by the project site layout plan, site profile and wiring diagram for a MALSR or MALSR system. For a typical standard site layout plan, site profile, and wiring diagram for the type of equipment being installed, refer to Orders 6850.8, Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR), and 6850.11, Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR). The access road and turnaround, which shall be constructed in accordance with access road Drawings D-5980-1 and 3, are optional and should be site-determined by regional requirements. Actual siting of the system shall be in accordance with the latest edition of Order 6850.2, Visual Guidance Lighting Systems. Drawing D-6086-0 is the title sheet for MALS and MALSR low-impact resistance structures with light mounting height 40 feet-0 inches to 128 feet-0 inches. Drawings D-6086-1 and D-6086-2, establish in a tabular form the 40 feet-0 inches to 128 feet-0 inches mounting height configurations for 1- and 2-tower structures respectively. The two-tower assembly is to be used at the 1,000-foot bar. The regions will select the appropriate tower height configurations for each location.

Drawings D-6086-3 thru D-6086-8 have been developed as a construction standard for the 20-foot low-impact assembly as specified in FAA-E-2640, 20-Foot High, Low-Impact Resistance (LIR) Structures, Medium-Intensity Approach Lighting Systems (MALS, MALSR), Light Mounting Heights From 40 to 128 Feet, and installed in accordance with the manufacturer's instruction book and Specifications FAA-C-2626 with Amendment 1, Construction of a Medium Intensity Approach Light System with Runway Alignment Indicator Lights. Drawings D-6086-9 thru D-6086-25 and Specifications FAA-C-2626 with Amendment 1, Construction of a Medium Intensity Approach Light System with Runway Alignment Indicator Lights, provide fabrication and erection standards for 1- and 2-steel towers, platform, and bridge. Drawings D-6086-26 and 27 establish the foundation design for 1- and 2-steel tower structures, respectively. Foundation designs are based on a minimum safe soil-bearing capacity of 3,000 pound-force per square foot (psf) for the applied loading conditions tabulated in the drawings. Depth of foundation footing shall be as shown on the drawings or two feet below local frost level, whichever is greater. The local frost-depth shall be as noted on the project site plan. Where actual site soil-bearing strength is less than 3,000 psf and/or the local level is greater than 5 feet-0 inches, the foundation designs as shown on the drawings shall be modified as required to suit existing soil conditions. Drawing D-6086-26 and Specification FAA-C-2626 with Amendment 1, Construction of a Medium Intensity Approach Light System with Runway Alignment Indicator Lights, have been developed as an electrical installation standard for the 20-foot, low-impact resistance assembly. Power source configurations are site-determined, therefore, the most economical service extension shall be set forth on the project site layout and an appropriate service extension detailed drawing developed. The steel tower structures may be used as line or end towers, as appropriate, to support the overhead electrical cable for MALS or MALSR. Site conditions will determine whether the installation of the electrical cable shall be overhead or underground. The installation of the overhead electrical cable shall be in accordance with paragraph 225 of the current issue of the National Electrical Code.

b. Retrofit. Drawings D-6085-0 thru D-6065-10 and Specifications FAA-C-2626 with Amendment 1, Construction of a Medium Intensity Approach Light System with Runway Alignment Indicator Lights, establish construction standards for modifying the existing MALS or MALSR support structures with light mounting height 40 feet-0 inches to 128 feet-0 inches for the installation of the 20-foot low-impact resistance assembly. These drawings shall be supplemented with Drawings D-6086-3 thru D-6086-8 and D-6086-28 for the installation of the site-delivered, 20-foot, low-impact resistance assembly. All of the above drawings shall be preceded by a project site layout, as required for each site. Drawing D-6065-0 is a title sheet for retrofitting existing MALS or MALSR structures with light mounting height 40 feet-0 inches to 128 feet-0 inches. Drawings D-6065-1 and D-6065-2 establish, in a tabular form, the 40 feet-0 inches to 128 feet-0 inches mounting height retrofit configurations for line, end, and bridge towers. Drawings D-6065-3 thru D-6065-10 have been developed as a fabrication and erection standard for the new steel tower section required in the retrofit. The new steel tower section shall be procured by the regions, as required.

Drawings D-6086-3 thru D-6086-8 shall be used as the construction standard for the 20-foot, low-impact resistance assembly and installed on the modified steel structure in accordance with the manufacturer's instruction book and Specification FAA-C-2626 with Amendment 1, Construction of a Medium Intensity Approach Light System with Runway Alignment Indicator Lights. The interface of the existing electrical system with the new electrical system shall be site-determined and shown on the electrical wiring drawings prepared by the regions.

c. Inquiries and Comments. Inquiries or comments regarding these drawings shall be directed to the Chief, Environmental Systems Division, AAF-500, Airway Facilities Service.

6. ELECTRICAL EQUIPMENT. The electrical equipment for establishing MALS or MALSR systems with light mounting height 40 feet-0 inches to 128 feet-0 inches, and for retrofit of existing MALS or MALSR systems with light mounting height 40 feet-0 inches to 128 feet-0 inches, shall be designated in Orders 6850.8, Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR), and 6850.11, Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR).

7. DEVIATION FROM STANDARD. No deviation from the standard is authorized without the prior approval of the Director, Airway Facilities Service. Regional site adaptation to accommodate terrain, utility connections, parking lots, access roads, and similar details are authorized without further clearance. Dimensional errors, discrepancies, or suggestions for modification or addition of details should be brought to the attention of the Chief, Environmental Systems Division, AAF-500, Airway Facilities Service.

8. CORRECTIONS TO STANDARD. Corrections to the standard may be made by the Director, Airway Facilities Service, without further regional or inter-service coordination. These may include corrections of dimensional errors, misspellings, and modification, addition or deletion of minor details.

9. DISTRIBUTION OF DRAWINGS. A reproducible copy of each drawing is being forwarded to the FAA Technical Center; each region (except AEU), Attention: Airway Facilities Division; and two copies of each drawing to the Aeronautical Center, Attention: Chief, FAA Depot. Additional copies may be obtained from the Administrative Staff, Airway Facilities Service, Attention: AAF-10.



for GERALD L. THOMPSON  
Director, Airway Facilities Service

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Appendix 1

APPENDIX 1. MEDIUM INTENSITY APPROACH LIGHTS SYSTEM,  
40'-0" to 128'-0" MOUNTING HEIGHT

<u>Number</u>	<u>Date</u>	<u>Title</u>
D-6086-0	9/18/81	Title Page
D-6086-1	9/18/81	System Height Configuration - Single GPI Tower
D-6086-2	9/18/81	System Height Configuration - Bridge Tower
D-6086-3	9/18/81	Low-Impact Resistance Assembly
D-6086-4	5/24/76	Low-Impact Resistance Tube Details
D-6086-5	5/24/76	MALS and RAIL Lamp Support Details
D-6086-6	5/24/76	MALS T-Bar Details
D-6086-7	5/24/76	Low-Impact Resistance Tube Clamp Details
D-6086-8	5/24/76	Lifting Frame Details
D-6086-9	9/18/81	Steel Support Tower Platform Details
D-6086-10	9/18/81	Lighting Bridge
D-6086-11	9/18/81	Parallel Tower Section "A"
D-6086-12	9/18/81	Parallel Tower Section "B"
D-6086-13	9/18/81	Parallel Tower Section "C"
D-6086-14	9/18/81	Parallel Tower Section "D"
D-6086-15	9/18/81	Parallel Tower Section "E"
D-6086-16	9/18/81	Sloped Tower Section "S1"
D-6086-17	9/18/81	Sloped Tower Section "S2"
D-6086-18	9/18/81	Sloped Tower Section "S3"
D-6086-19	9/18/81	Sloped Tower Section "S4"
D-6086-21	9/18/81	Base Assembly - Vertical "BAV"
D-6086-22	9/18/81	Sloped Base Assembly "SBA1"

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<u>Drawing</u>	<u>Date</u>	<u>Title</u>
D-6086-23	9/18/81	Sloped Base Assembly "SBA2"
D-6086-24	9/18/81	Sloped Base Assembly "SBA3"
D-6086-25	9/18/81	Sloped Base Assembly "SBA4"
D-6086-26	9/18/81	Single Tower Foundations
D-6086-27	9/18/81	Bridge Tower Foundations
D-6086-28	5/24/76	Wiring of Low-Impact Resistance Assembly

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Appendix 2

APPENDIX 2. MEDIUM-INTENSITY APPROACH LIGHTS SYSTEM, 40'-0" to 128'-0"  
MOUNTING HEIGHT - RETROFIT EXISTING MALSR SYSTEMS

<u>Number</u>	<u>Date</u>	<u>Title</u>
D-6065-0	9/18/81	Title Page
D-6065-1	9/18/81	Retrofit Line Tower Chart
D-6065-2	9/18/81	Retrofit Bridge & End Tower Chart
D-6065-3	9/18/81	Tower Section "W," Tower Section "X"
D-6065-4	9/18/81	Tower Section "Y"
D-6065-5	9/18/81	Tower Section "Z"
D-6065-6	9/18/81	Tower Section "SR"
D-6065-7	9/18/81	Replacement Tower Section Vertical-BAU
D-6065-8	9/18/81	Replacement Tower Section Sl/2
D-6065-9	5/24/76	Revised Tower Platform A, B, & P
D-6065-9-1	9/18/81	Revised Tower Platform P for Flasher Only
D-6065-10	5/24/76	Revised Bridge Platform "BD"

